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The Honey Bee.

(THIRD MODICUM.)

The bees have yet one greater enemy than those enumerated, and that is man. This leads us to consider the different systems of management and harvesting which he has adopted; and some consolation it is that, various as may be the plans proposed, there is only one exception, among the many bee-books we have lately read, to the heartily expressed wish that the murderous system of stifling the bees, may be wholly condemned and abolished. Indeed, if Mr. Cotton's statement be correct, England shares with the valley of Chamouni the exclusive infamy of destroying the servants whose toil has been so serviceable. Cobbett says, it is whimsical to save the bees, if you take the honey; but on the other hand to sacrifice them for the sake of it, is killing the goose for her golden eggs. A middle line is safest: take a part. First, be sure that you leave enough to carry a stock fairly through the winter—say thirty pounds, hive and all—and the surplus is rightly your own, for the hives and flowers you have found them, and the trouble and time you have bestowed. To devise such a method, has engaged the attention of English beemasters for many generations back; and to eke out the hive by a temporary chamber which may be removed at pleasure, has been the plan most commonly proposed. Dr. Bevan gives a detailed account of the different schemes, to which we refer readers curious in such matters. There can be but three ways of adding to a hive—first, at the top, by extra boxes, small hives, caps, or bell glasses, which may be called generally the storifying or *supering* system; secondly, at the side, by box, &c.,

called the *collateral* system; and thirdly, by inserting additional room at the bottom, called *nadiring*.

Before entering further on the various construction of hives, we must premise for the uninitiated that bees almost invariably begin building their combs from the top, continuing down as far as room allows them, and finishing off at the bottom in a rather irregular curved line. Each comb contains a double set of honey-cells, *dos-a-dos*, in a horizontal position. To support these in common straw hives, cross-sticks are used, around which the bees work, so that the comb is necessarily much broken in detaching it from these supports. Now it having been observed that bees, unless obstructed, always work their combs exactly parallel, and at a certain distance apart, a hive has been constructed somewhat in the shape of a common straw one, only tapering more towards the bottom, and having a lid lifting off just where the circumference is largest. On removing the lid are seen bars about an inch broad and half an inch apart, running parallel from the front to the back of the hive, and these being fixed into a ring of wood that goes round the hive, are removable at pleasure. Now it is obvious that, could we always get the bees to hang their combs along these bars, the removal of one or two of them at a time, would be a very simple way of procuring a fair share of honey without otherwise disturbing the hive. But how to get the bees always to build in this direction was the question. This Huber solved. He fixed a small piece of comb underneath each of the bars exactly parallel; the bees followed their leader, so that any one of the pendant combs might be lifted up on the bar, the bar replaced, and the bees set to work again. This starting point for them to commence from, is called the *guide-comb*, and the hive itself, though

somewhat modified, is that of the Greek Islands; the very form, perhaps, from which the Corycian old man, bringing it from Asia Minor, produced his early swarms;—from which Aristotle himself may have studied;—and which, no doubt, made of reeds or osiers of the Hyssus, had its place in the garden of Socrates—

"That wise old man by sweet Hymettus' hill."

We must refer our readers to Dr. Bevan's book for the later improvements on this hive, as respects brood and honey cells (for these are of different depths,) and the fixing of the guide-comb suggested by Mr. Golding.

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Safety from bees is not to be gained from any modification of hive or bee-dress whatever. If a man means to keep bees he must make them his friends; and the same qualities which will ensure him golden opinions in any other walk of life, are those which make a good beemaster. Firmness of mind with kindness of manner will enable you to do with them what you will. Like horses, they know if you are afraid of them, and will kick and plunge accordingly. Like children and dogs, they find out in a moment if you are fond of them, and so meet you half way. But, like the best tempered people in the world, there are times and seasons when the least interruption or interference will put them out of humor. A sharp answer or a sharp sting on such occasions will only be a caution, that we must watch our opportunity better for the future. He who rushes between contending armies must not complain of the flying darts; therefore in a bee-battle, unless you are sure you can assist the weaker party, it is best to keep out of the way. In very hot weather and very high winds—especially if one has much to do or say—who does not feel a little testy? Bees are the same. There is one other case where interference is proverbially ill-taken—in domestic quarrels; and herein Mr. Cotton assures us that the female spirit is as much alive in the bee as in the human kind. When the time comes in autumn for turning the drones out of the hive (of which we shall speak more fully presently,) many think they can assist the bees in getting rid of these unprofitable spouses, and so destroy them as fast as they are turned out. This uncalled-for meddling is often very fiercely resented, and the bee-keeper finds to his cost, like a good-natured neighbor who proffered his mediation on the "toast and bread-and-butter" question of Mr. and Mrs. Bond, that volunteer peacemakers in matrimonial strife

"Are sure to get a sting for their pains."

At all other times they are most tractable creatures, especially when, as at swarming time, they are in some measure dependant on man's aid. They are, as a villager once told us "quite humble bees then." They undoubtedly recognize their own master; and even a stranger, if a beekeeper, soon finds himself at home with them. What they cannot bear is to be breathed upon; and as people ignorant of their ways are very apt to begin buffeting and blowing when bees seem disposed to attack them, it will be serviceable for them to keep this in mind. The Rev. John Thorley, who wrote in 1744, gives a frightful account of a swarm of bees settling on his maid's head—the fear being not that they would sting her to death, as stories have been told,* but that they would stifle the poor girl, for they covered her whole face. Presence of mind failed neither—he bade her remain quite still, and searched for the queen, whom her loyal people followed with delight as he conducted her safe to her hive. Sometimes, however, where presence of mind is wanting, or where the bees have been accidentally disturbed, very serious consequences ensue.

The Bee volume in the "NATURALISTS' LIBRARY" supplies us with an anecdote, in which the anger of the bees was turned to a more profitable purpose:—

"A small privateer with forty or fifty men, having on board some hives made of earthenware full of bees, was pursued by a Turkish Galley manned by 500 seamen and soldiers. As soon as the latter came alongside, the crew of the privateer mounted the rigging with their hives, and hurled them down on the deck of the galley. The Turks, astonished at this novel mode of warfare, and unable to defend themselves from the stings of the enraged bees, became so terrified that they thought of nothing but how to escape their fury; while the crew of the small vessel, protected by masks and gloves, flew upon their enemies sword in hand, and captured the vessel without resistance."

It must strike the reader how well furnished this vessel must have been to afford on the moment "masks and gloves" for forty or fifty men. In these disturbed times the following receipt to disperse a mob, may perhaps be found useful.

* For fatal cases, one of which is related by Mr. Lawrence, in his Surgical Lectures, see Dr. Bevan's book, page 333. Animals have been frequently fatally attacked by them. Butler tells of "a horse in the heat of the day looking over a hedge, on the other side of which was a stall of bees. While he stood nodding with his head, as his manner is, because of the flies, the bees fell upon him and killed him." This exemplifies the proverb of the danger to some folk in "looking over a hedge."

We have heard of a water engine being effectively employed in the same service:

"During the confusion occasioned by a time of war, in 1525, a mob of peasants assembling in Hohenstein, in Thuringia, attempted to pillage the house of the minister of Elende, who, having in vain employed all his eloquence to dissuade them from their design, ordered his domestics to fetch his bee-hives and throw them in the middle of this furious mob. The effect was what might be expected. They were immediately put to flight, and happy to escape unstung."

As we should be sorry to rouse the fears of our readers, our object being rather to enamour them of bees, we will console them—too much perhaps in the fashion of Job's friends—with an anecdote which appeared lately in a Scotch newspaper, of an elderly gentleman upon whose face a swarm of bees alighted. With great presence of mind, he lifted up his hat, hive-like, over his head, when the bees by their natural instinct, at once recognizing so convenient a home, betook themselves to his head-gear:—it surely must have been a *wide-awake*—which he then quietly conveyed into his garden. Had he fidgeted and flustered, as most old gentleman—and young ones too—would have done in his situation, he would doubtless have presented the same pitiable object that our readers must remember in Hood's ludicrous sketch of an "unfortunate Bee-ing."

We have spoken of the possibility of bee-pasturage being overstocked, and such may be the case in certain localities; but we are very confident that this is not the general state of the country. We are assured that hives might be multiplied tenfold, and yet there would be room; for certainly more than five times the quantity of honey might be taken. But then it will require an improved system of management, more constant attention paid to the hive, more liberal feeding in spring and autumn, and more active measures against their chief enemies. In all these matters we must look to the enterprising, intelligent and philanthropic classes to take the lead. We know many, both rich and poor, who do not keep bees on account of the murder they think themselves forced to commit. Let such be assured that this slaughter is not only unnecessary, but unprofitable too. But, on the other hand let no one fancy that all he has to do is to procure a swarm and hive, and set it down in the garden, and that streams of honey and money will forthwith flow. Bees, like everything else that is worth possessing, require attention and care. "They need," says a poor friend of ours, "a deal of shepherding;" and thus, to the individual who

can afford to give them his time, they may be made a source of great profit as well as pleasure. Our own sentiments cannot be given better than in Mr. Cotton's words:

"I would most earnestly beg the aid of the clergy and resident gentry—but, above all, their good wives; in a word, of all who wish to help the poor who dwell round about them in a far humbler way, yet perhaps not less happily; I would beg them, one and all, to aid me as a united body in teaching their poor neighbors the best way of keeping bees. . . . A hive of bees keeps a man at home; all his spare moments may be well filled by tending them, by watching their wondrous ways, and by loving them. In winter he may work in his own chimney corner at making hives, both for himself and to sell. This he will find almost as profitable as his bees, for well made hives always meet with a ready sale. Again if his bee hives are close to his cottage door; he will learn to like their sweet music better than the dry squeaking of a pot-house fiddle, and he may listen to it in the free air, with his wife and children about him."

We hold to the opinion already expressed, of presence of mind being the best bee-dress, notwithstanding the anecdote of M. de Hofer, privy counsellor to the Grand Duke of Baden, who, having been a great beekeeper, and almost a rival of Wildman in the power he possessed over his bees, found, after an attack of violent fever, that he could no longer approach them without exciting their anger—in fact, "when he came back again, they tore him where he stood." "Here, then, it is pretty evident," says the doctor who tells the story, "that some change had taken place in the counsellor's secretions, in consequence of the fever, which, though not noticeable by his friends, was offensive to the olfactory nerves of the bees." Might not a change have taken place in the counsellor's nerves?

As critics as well as counsellors may be stung, we have, for our own good and that of the public, examined all the proposed remedies, and the result is as follows:—Extract at once the sting, which is almost invariably left behind: if a watch key is at hand press it exactly over the wound, so that much of the venom may be squeezed out; and in any case apply, the sooner of course the better, Laudanum or the least drop of Spirit of Ammonia. Oil and honey which are also recommended, probably only act in keeping off the air from the wound. The cure varies very much with the constitution of individuals; but the poison being acid, any alkali will probably be serviceable.

But, with reference to the cottager, we must consider the profit as well as the sting; and this it will be far better to underrate than to exaggerate. Tell a poor man that his bees, with the most ordinary care, will pay his rent, and he will find your word is good, and that he has something to spare for his trouble. He may then be led to pay the same respect to his little lodgers as the Irish do to the less cleanly animal that acts the same kindly part of rent payer by them. But when the marvellous statistics of some bee books are laid before a laborer, their only effect can be to rouse an unwonted spirit of covetousness, which is more than punished by the still greater disappointment that ensues.

Dr. Warden, a physician of Croydon, who wrote in the year 1712, a book called "The True Amazons, or the Monarchy of Bees,"—and of whom we can discover nothing more than that the front of his bee-house was "painted with lions and other creatures not at all agreeable,"—found the neighboring furze of Coombe and Parley not "unprofitably gay," if we may believe his assertion that his bees brought him in two hundred dollars a year. He might have passed rich at that time in such a locality, if his physician's fees brought him in an equal sum. That the ancients did not neglect the profit to be derived from their hives, we learn from Virgil's old gardener—to whom we cannot too frequently recur; and from two veteran brothers mentioned by Varro—the types perhaps of the Corycian of the Georgics—who turned the little villa and craft left them by their father, into a bee-house and bee-garden, realizing, on an average, 10,000 sesterces a year. They seem to have been thrifty old bachelors, and took care to bide a good market. Among the plunder of Verres were about 400 amphora of honey.

We will now suppose that, having made up our mind on the matter of profit, and being sting-proof, we have got an old-fashioned straw-hive, which we purchased in autumn for a guinea, safely placed under our heath-thatched bee-house; that we have also got one of the improved Grecian straw-hives ready to house the first swarm in. Some fine morning in May or June, a cluster of bees having hung out from the hive some days before, the whole atmosphere in the neighborhood of the bee-house seems alive with thousands of the little creatures, whirling and buzzing, passing and repassing, wheeling about in rapid circles like a group of maddened bacchanals. This is the time for the bee-master to be on the alert. Out runs the good housewife with the frying-pan and key—the orthodox instruments for *ringing*—

and never ceases her rough music till the bees have safely settled in some neighboring bough. This custom, as old as the birth of Jupiter, is one of the most pleasing and exciting of the country-man's life. Hogarth, we think, introduces it in the back ground of his "Country Noises," and there is an old colored print of bee-ringing still occasionally met with on the walls of a country inn that has charms for us, and makes us think of bright sunny weather in the dreariest November day. We feel quite with Mr. Jesse, that we should regret to find this good old custom fall into disrepute. Whether, as Aristotle says, it affects the bees through pleasure or fear, or whether indeed they hear at all, is still as uncertain as that philosopher left it; but we can wish no better luck to every beemaster that neglects it, than that he may lose every swarm for which he omits to raise this time-honored concert.

The first settlement, or clustering, is, without doubt, merely a rendezvous before their final emigration. If not hived, they will soon be off, and in a direct line, for some convenient spot which has been marked by them before. We have known them to make straight for an old hollow pollard, the only one to be found within a mile or two of the hive! The old queen always accompanies the first swarm; and for this a fine day is reckoned more necessary than for the after-swarms, as it is the old lady that shows the greatest dislike to leave home in bad weather. If this swarm again sends forth a colony the same year, as sometimes occurs, it is the same queen again which puts herself at the head of her nomade subjects. Indeed there seems to be very little of the old woman about her.

There appears to be no unerring method by which the exact time when the first swarm will leave the hive, can be determined—their hanging out from the entrance being very fallacious—except by watching the general state of things within. With the after-swarms, however, there is a most curious and certain sign in the "piping" or "trumpeting" of the queen and the princesses, to which we have before referred. About the ninth day from the issuing of the first swarm, if another colony is about to leave the hive, this singular duet, in the most regular intonation, between the emerged queen and the princess still a prisoner in her cell, is heard; and extravagant as the account may seem, and confused and embellished as it has been from the times of Aristotle and Virgil till recent days, it is now the practical sign by which every attentive bee-keeper judges of the time of emigration of the after-swarms.

The second swarm is called a "cast,"* the third a "smart," the fourth a "squire." A swarm from a swarm is called a "maiden or virgin swarm," and the honey is reckoned more pure. It seldom, however, happens that there are more than two from the same hive, except in a year when the season opens unusually early, the pasturage is uncommonly abundant, and the weather continuously favorable. There are, on an average, two particularly good years in every ten, and one particularly disastrous to the bees—as was the year 1860.

It is time to say something of her Majesty of the Hive. She is the mother as well as the queen of her people, laying from 80,000 to 100,000 eggs in a year; and it is not till she gives symptoms of continuing the race, that the full tide of her subjects' affection is poured forth towards her. There are different cells formed for the queen, the worker and the drone. The bees, like a wise and loyal people as they are, do not stint their sovereigns to the same narrow mansions as content themselves. They build their royal cells much thicker and stronger, and of more than twice the size. Nay, unlike the surly Brighton blacksmith, who hesitated to give up his house for the convenience of his sovereign, they think nothing of pulling to pieces and converting several of their common cells when royalty requires it; and vote with alacrity in their committee of supply every demand made for the extension and improvement of their sovereign's palace. When finished, these miniature mansions resemble the inverted cup of an acorn somewhat elongated. We said that each hath its peculiar cell. But it has happened, either in the flurry of the queen, or from some unaccountable accident, that a drone egg has been placed in a royal cell. Time goes on, and the egg swells, and becomes a larvæ, and then a pupa, and the bees feed it with royal food, watch its progress with anxious care, and hover in the ante-chamber in nervous expectation of the royal birth. Judge then of their surprise when, instead of a princess royal, if any thing comes forth, out walks the awkward and mystified changeling of a drone. Usually, however, the drone larvæ which chanced to be nursed in a royal cell, dies before maturity; and the cell, when opened, is found to contain merely a *caput mortuum*.

*The following *doggerelized* "proverbial philosophy" will give the supposed relative value of early and late swarms:—

"A swarm of bees in May
Is worth a load of hay;
A swarm of bees in June
Is worth a silver spoon;
A swarm in July
Is not worth a fly."

It would be an endless work to recount the many stories told of the devoted attachment of these good people to their queen. Her presence among them is their life and glory. She is the mainspring upon which all their work, their order, their union, their happiness seems to turn. Deprive them of her, and all is confusion, disorder, and dismay. They seem to mourn for her when dead, and can with difficulty be withdrawn from her corpse. All the wonderful works with which Wildman, the bee-conjuror, astonished the last generation, were effected by taking advantage of their instinctive loyalty. He made the bees follow him whither he would; hang first on this hand, then on that, or settle where his spectators chose. His secret consisted in having possession of the queen, whom they clustered round wherever he might move her. Nor are they merely summer friends; the workers will defend their queen in the utmost strait, and lay down their lives for her—for they sting but once, and that sting is death to them;

"Animasque in vulnere ponunt."

We must not, however, invariably expect the same conduct; perhaps, indeed, if it were so, it would lower the quality of the feeling, and reduce it to too mechanical an instinct. Bees like men, have different dispositions, so that even their loyalty will sometimes fail them. An instance not long ago came to our knowledge, which probably few beekeepers will credit. It was that of a hive, which, having early exhausted its store, was found, on being examined one morning, to be utterly deserted; the combs were empty, and the only symptom of life was the poor forsaken queen herself, "unfriended, melancholy, slow," crawling over the honeyless cells; a sad spectacle of the fall of bee-greatness. Marius among the ruins of Carthage, or Napoleon at Fontainebleau—were nothing to this!

[For the "Bee Journal."]

A royal Cell opened by the Bees, and closed again.

On opening a nucleus, whose queen had just hatched, I found the bees busily engaged in destroying the remaining queen cells—three of which they had opened on their sides. Two of these cells, which contained queens still alive and nearly mature, I removed—taking away the hatched queen, and giving the colony brood from which to rear a new supply. On examining the hive again, the third royal cell, which contained a queen much less matured, had been closed again, the bees covering the opening with a protuberance of wax lighter colored and smoother than the body of the cell, and very much like the cap put on the apex of the royal cell.

L. L. LANGSTROTH.

[For the "Bee Journal."]

Very Knowing Bees.

Mr. Sanderson, (son of the Rev. Mr. Sanderson of this place,) sends the following interesting fact in Natural History, from Arequipa, Peru:—

"A few years ago, a German got out a few hives of bees, an insect formerly unknown here. The first year he obtained a plentiful supply of honey, but year by year it decreased, until now the animals will hardly collect any. And why? Our climate is so equable that flowers can be had all the year round, and the sagacious animals having discovered this fact, have evidently lost the instinct of hoarding honey for a winter that never comes."—*Brechin Advertiser.*"

In accepting the facts in the above statement, I feel at liberty to differ from Mr. Sanderson in my conclusions. It has been conclusively shown in several articles in late numbers of the American Bee Journal, that the length of life of the worker bee is limited to one year; and that, during the honey-gathering season, the majority meet death in various ways incidental to all climates, namely high winds, sudden storms, birds, insects, &c., before four months old—I therefore conclude, from the short life of the worker bee, that it never loses "the instinct of hoarding honey for a winter that never comes."

The truth I feel assured is just here—man's mismanagement. The German probably managed his bees as commonly managed in his own country, or in some other way not suited to the latitude of Peru. If the size of hives were retained, the bees would soon fill them with honey to such an extent that the queen having but few empty cells to deposit her eggs in, it would be impossible, under the old *immovable* comb system, to keep up the strength of the colony. The mortality in such case would be greater, during a certain period, than the increase by births. We have here one of the evils of "over-wealth" as described by Butler. The remedy for this condition is to be found in the removal of surplus stores from the body of the hive, to make room for brood. This can be most readily done with the movable comb hive, which under every circumstance, by proper management, enables one to keep his stocks strong. A strong stock works with more vigor than a feeble one. With strong stocks there is no difficulty in securing as much honey, in one favorable year, as in another equally favorable, *winters omitted* or not, for any number of years.

When a hive is suffering from decreasing population, the queen not having a sufficient number of empty cells to deposit her eggs in, remove one or more full frames, and replace with empty frames. Space is thus given, and in the construc-


tion of the new comb, which is mostly done at night, the queen often fills the majority of the cells with eggs, and so eager is she, in discharging this duty, that she deposits eggs in rudimentary cells, the sides of which are afterwards completed. Even in this latitude, colonies some years suffer from the breeding portion of their hive being too full of stores early in the season. Such swarms enter upon the winter well provisioned, but contain too few bees to winter safely in the open air, and too few young bees to profitably carry on the spring labors of the hive. One bee hatched in September or October is worth two of an earlier date.

Mr. Quinby, of St. Johnsville, N. Y. (one of our most noted apiarians, whose name I have been anxiously looking for in this Journal since its first number,) thus writes in the August Number of the "Am. Agriculturist." "Beekeepers the present season, taking Montgomery County as a sample, will have a difficulty to contend with just the reverse of the one last year. The bees then obtained too little honey, this year too much, at least for their future prosperity. So great a portion of their combs will be filled with honey, that the number of cells left for breeding will be insufficient to keep the colony in its usual strength. This will be the case should there be no unusual change in the yield of honey this month. The remedy is at hand, for those having the movable combs. It is simply removing one or more outside, or any other combs that may be filled with honey throughout, and substituting empty frames or frames with empty combs. Make room for them near the middle, by moving those in the centre outward. The full combs can be set away, and given to any late swarms that do not obtain sufficient winter stores; or, if the colonies from which they were taken have not enough, they may be returned. When not wanted thus, save for the table."

In this latitude, when a swarm diminished in population by over-wealth, survive the winter, they start the new year with a fair prospect of success; the queen on the opening of spring finds thousands of empty cells at her disposal, and the colony is soon strengthened for the summer's work. Here the climate often corrects this difficulty; there man must apply the remedy.

The movable comb system has very great advantages over any other, in northern latitudes. In equatorial regions it becomes indispensable to success.

E. P.

 The admirable industry of the bee is not to be ascribed to the acting of a free and separate will.—MALTE-BRUN.

The Dzierzon Theory.

BY THE BARON OF BERLEPSCH.

No. IX.

I purpose adding a few numbers involving theory only incidentally, and having a more direct practical application.

1. In how many days from the time the egg is laid is a queen-bee fully developed?

Without recourse to special experiments it is by no means easy to arrive at a satisfactory conclusion: though we may readily deceive ourselves and fancy that the queen matures in a shorter time than is actually required. In pre-constructed royal cells, the queen is rarely seen to lay (I, at least, never saw her do so;) and in post-constructed cells, we cannot know with certainty the age of the larva selected for the regal dignity. Thus the matter remains, in a large degree, one of doubt and conjecture. I made two experiments in the hope of settling the question.

On the 6th of July, 1851, at 11 o'clock in the forenoon, I introduced a small forced swarm in a hive containing, among empty frames, one filled with comb. At one o'clock in the afternoon I examined the latter, and found a considerable number of eggs in the cells. I then removed the queen, took out the empty frames, substituting for them others filled with comb, and placed the one containing the eggs against the glass side of the hive, so that I could conveniently watch the construction of the royal cells. Only three were built, all of which were still open on the evening of the 15th. At 5 o'clock on the morning of the 16th, two were closed—nearly ten days, consequently, after the eggs were laid; and at three o'clock in the afternoon, the third was also closed. This last was preserved by the bees, and the first two were destroyed by them on the 21st. On the 24th, at 10 o'clock in the forenoon, the remaining cell was still closed; but at two o'clock in the afternoon it was open and the queen had emerged. Hence the time required for the development of the queen, in this instance, was fully eighteen days.—A second similar experiment, made in 1853, furnished a slightly different result. The queen emerged in seventeen days. I neglected, in this case, to note the time when the cell was closed.

These experiments show that the opinion generally entertained, that the queens emerge between the seventeenth and eighteenth day after the eggs are laid, is correct. The results obtained when force swarms are made, also corroborate this; for, according to my observation, *teeting* is

usually heard, in the parent hive, on the fourteenth day. Now, if we assume $2\frac{1}{2}$ days as the time required for the egg to hatch, and that the larva selected was $1\frac{1}{2}$ days old when chosen, we shall again have from seventeen to eighteen days as the time in which the queen matures. I have, indeed, frequently heard the *teeting* on the thirteenth day; occasionally, though rarely, not till the fifteenth; and still more rarely as early as on the twelfth. Dzierzon says he has heard it on the tenth; but this is readily accounted for by the varying age of the larva chosen, and is consequently entirely reconcileable with the normal period of from seventeen to eighteen days. I will only add, in passing, that the bees do not, as is commonly stated in the books, usually select a larva three days old, but in most cases a younger one. But whether they occasionally also select an egg for the purpose is an interesting query, to which, however, I have not hitherto directed my attention.

Dzierzon states (page 3 of his supplementary treatise), "in parent stocks, from which forced swarms had been taken, I have frequently found queens emerged on the eleventh day, though generally they appear on the twelfth or thirteenth, and are vigorous enough already on the fourteenth to accompany the afterswarm at the usual period." That my observations differ somewhat from this, is manifest from what I have stated above, and they constrain me to assume the fifteenth or sixteenth day as the normal period for the issuing of afterswarms. It is very possible that one of us is in error here, and the matter is a fair subject for future investigation.

In the first of my experiments the bees capped the royal cell on the tenth day, and eight days thereafter the queen emerged. I think (though I am not sure,) that I have not unfrequently noticed the capping of such cells several days sooner; and also that the queens emerged several days later. I trust that these points will yet be definitely ascertained by careful and reliable observers.

2. Can the workers transfer eggs or larvae?

Dzierzon denies *in toto* their ability to do this. That they do not commonly do it, is evident from the structure of the post-constructed cells. Why should these have their peculiar form, if the eggs or larvae were transferred into them? I could also adduce numerous instances in which it is certain that no transfer was made. But the question is whether they *cannot* in any case, make such transfer. This I am not prepared to assert, and must regard it as a topic fairly open for further investigation. I can only say that since

Burnens succeeded in transferring both eggs and larvæ from cell to cell, and I have myself transferred eggs in like manner without injuring them, (though my attempts to transfer larvæ failed,) I cannot but suspect that the bees may be equally expert. Besides all this, the Rev. Mr. Schiller, of Frömmstedt, who is a practical apiarian, thoroughly acquainted with Dzierzon's theory, related to me the following occurrence. One of his neighbors inserted a piece of comb containing eggs and unsealed larvæ in the *rearmost* comb of a hive, the colony in which had no queen and only capped brood nearly mature. The colony which was very small and clustered on the anterior combs, neglected to cover and nurse the inserted eggs and larvæ, and suffered it to perish. A week later, when the owner opened the hive for thorough examination, he discovered this fact, but was also surprised to find, attached to one of the *front* combs, a sealed royal cell from which a queen subsequently emerged. If this case is correctly reported, the question regarding the ability of the workers to make such transfers, must be considered settled. But as the observer was comparatively a novice in bee culture, it is possible that he may have been deceived. I purpose making some experiments next summer, which I trust will finally dispose of the controversy.*

3. *How old may a worker-larva be, and still be susceptible of development as a perfect queen?*

The current opinion, dating from the time of Schirach, is that a queen can only be reared from a worker larva not much more than three days old. Dzierzon, in his supplementary treatise, page 2, says—"I have noticed that worker larvæ, so far advanced that they nearly fill their cells, will still be developed as perfect queens, if before capping, the cell be somewhat enlarged and widened, and the larvæ supplied with the appropriate pabulum." Incredible as this at first seemed, I have found it is nevertheless true; as the following experiment, which I made last summer, conclusively shows. On the 10th of June, I took a worker comb containing eggs and larvæ in various stages of development, and cut out the cells in which were the eggs and the younger larvæ, suffering only the cells containing the older larvæ nearly ready for capping to remain. This left only forty-one open cells in the comb. I now fitted up a hive with empty combs, inserting the one thus prepared among them, and then introduced a forced swarm deprived of its queen. I set this hive in the place of the parent stock, and on the 23d I found four royal cells on the

comb, which were so small and inconspicuous that I should not have observed them, had I not specially searched for them. They could scarcely be distinguished from common drone cells. I opened one of them, and the embryo had the appearance of a perfect royal nymph. The original worker cell retained its hexagonal form, so far as it had been filled by the unchanged larvæ, but the superadded portion was circular. The hive contained a considerable number of bees; but as I did not anticipate swarming, I concluded to let it stand till the worker brood matured. In this, however, I met with a disappointment, for on the 30th the queen issued with a swarm and the remaining bees soon after dispersed. The swarm thrived finely, and towards the close of July young workers emerged from the cells. The queen was of fair average size—neither larger nor smaller than queens usually are.

4. *How do queen-bees emerge from the royal cells?*

It is commonly said that they sever the cap of the cell by a circular cut along its periphery, allowing it to adhere to the body of the cell by a narrow strip only, which serves as a hinge, and then crawl out. This is true, yet still not entirely correct. On the 25th of June, 1853, about ten o'clock at night, I heard a *teeting* in one of my colonies which had not yet swarmed, and also heard several *quacking* responses. The occurrence being somewhat unusual, attracted my attention and excited my curiosity. The tones were louder than those usually heard prior to the issuing of a second swarm, doubtless because the young queens were fully mature—swarming having been prevented by a protracted spell of rainy weather. The queens may, besides, have all been of nearly the same age, the old queen having probably been undesignedly removed some time before, in the course of some operations I had made. Early next morning, with the assistance of Günther, I took out comb after comb, to secure the queens which had not yet emerged, by removing the royal cells. We found one queen at large, and ten others still confined, though fluttering and *quacking* occasionally in their cells. Günther took charge of the comb on which the emerged queen was found, which was well covered with bees, whilst I undertook to search for and remove the still closed royal cells. The emerged queen continued *teeting*, precisely as though she were still in the hive, and Günther reported that she crept about slowly on the comb, endeavoring to conceal herself among the workers, and *teeting* at brief intervals. When uttering these sounds, she stopped, turned her head downward, fixing herself firmly to the comb with her fore feet, and

*The results of these experiments will be given hereafter.—ED.

appeared also to press her abdomen against the comb—though this could not be distinctly observed by him, as she was constantly surrounded by a crowd of bees. Her wings remained entirely motionless. The emission of the sounds evidently required a considerable effort, as her abdominal rings became visibly distended and diverged. It was obvious, however, that she did not produce the sounds, as Gundelach supposes, by an attrition of the abdominal rings against each other, but by a forcible expulsion of air through the tracheæ. Thus far Günther. I could only observe that, when teeting, she cowered very close to the comb, and that the abdominal rings, though only slightly moved, were still shoved somewhat over each other. I observed this when Günther held the comb before me, while I was occupied with the royal cells, and hence could not make as minute an examination as I desired. While in the hive, the teeting queen (which is the only one at liberty,) runs rapidly to and fro on the combs; and I noticed frequently that such a queen then, too, endeavors to hide herself among the bees. I have often also seen her perched on a still closed royal cell.

Of the queens still enclosed in their cells when we opened the hive, seven emerged in about eight minutes, and I caught and confined them as they came forth. In one of the cells which I held in my hand, and in which there was much fluttering, I saw the queen suddenly pass one of her mandibles through the feeding and breathing aperture of the cap, and almost instantly emerge after making a circular cut along the margin of the cap. She obviously turned herself round during the operation, but did not cut the cap entirely off. It still adhered to the cell by a slight slip or band, and being pushed forward as the queen crawled forth, it at once fell back and closed the orifice when she had fully emerged. Her mandibles must be exceedingly keen cutting instruments, and her strength great, or she could not perform the operation so expeditiously. A worker could not accomplish it.

I placed two of the newly emerged queens under a bell-glass. At first they simply crawled about, seemingly unconcerned, on the inner surface of the glass; but they soon met and engaged in combat. They seized each other with their feet and mandibles, rolled about, struggling like two contending workers, and one of them was speedily dispatched. Two others, also placed under the glass, acted exactly in the same manner. This was the first opportunity I had to witness a combat between queens; and I did not before place much reliance on the accounts I had read

of such combats, because in my previous experiments the queens did not attack each other, but remained peaceably together. Those experiments, however, were made in autumn, when I united colonies; and it did not then occur to me that queens are not at that season particularly hostile to each other—as is evident from the fact that two have occasionally passed the winter in one hive. This is a fact which I have observed myself, and which has been fully verified by both Gundelach and Dzierzon. During the summer there is ever only one queen at large in the colony, and she is the one from which the sounds *teet, teet*, proceed when young queens are reared and are nearly mature. Hence this sound is always heard singly, as proceeding from one individual; whereas when several embryo queens are maturing simultaneously, the *quahking* may be heard proceeding from several places and different individuals. This is certainly the fact, though some careful observers have been deceived. Deception may easily occur even where a large glass hive is used and the teeting queen is seen on the comb. She is very rapid in her movements, and frequently after teeting disappears for an instant, teets when out of view, and instantly returns—leading us to fancy that the sounds proceed from different queens.

On the whole, I conceive that in the hives, ninety-nine queens out of every hundred destroyed, are killed by the workers, for one that perished in combat with another. Queens cannot, indeed, readily get into conflict, because when two chance to appear simultaneously in a colony, one or both are immediately surrounded and imprisoned by the bees. *Royal combats are the exception.*

5. Why do queens teet and quahk?

It is commonly and correctly said that they do so from *jealousy*; but treatises on bees do not furnish clear and satisfactory evidence of this; and the assertion that, till one queen has emerged and begins to *teet*, *quahking* is never heard in a colony, is certainly erroneous. It is supposed that the queen which first emerges *teets* when she becomes aware that rivals are concealed in the royal cells; and the still confined queens *quahk*, because they hear the teeting of the emerged one, which fills them with apprehension, and induces them to remain in their cells. Two observations which I made this summer, satisfied me that this view is not altogether correct. I found that the mature young queen (even if there be only one in the hive) always *quahks* for a time, in her cell, before she emerges and teets; and it seems natural that she should do so. In the early part of July,

I removed the queens of ten colonies, partly that the old might be replaced by young ones, and partly to ascertain whether the young queens, returning from their hymeneal trips, would readily find their respective hives when these were purposely placed close together; though my chief object was to check for a time the enormous production of brood and encourage the accumulation of honey. I immediately inserted a sealed royal cell in the hindmost combs of each hive, opposite the glass end, that I might conveniently watch the emerging of the queens. I examined them daily, and one evening distinctly heard a queen quahk. I ascertained that the sound proceeded from the still closed royal cell. I listened more than an hour, during which time the quahking was repeated at intervals; then the queen emerged and the quahking ceased. I intended to examine the hive thoroughly next morning, but when Günther and I arrived, we heard queens quahking in two other hives. At six o'clock, one of these emerged from her cell, and silence ensued. The other issued soon after; the workers cleaned and fed her; she then passed on to some of the inner combs, and we immediately heard her teet. This sound was frequently repeated, and we noticed that there was no quahking in response. We then took out comb after comb, and found six royal cells, some of them recently capped and others still open. Though they had been furnished with a sealed royal cell, the workers had started others in addition, in some of which the emerged queen apprehended rivals might be concealed, and therefore commenced teeting. There could, however, be no response, for all the embryos were still immature. We likewise examined the other two hives, containing the emerged queens, which had quahked before they left their cells, but did not teet. We found no royal cells in either of them.

From these observations, it is evident that young queens teet and quahk from sheer jealousy; and that every queen, before emerging, quahks for a time, to assure herself that no rival is at large in the hive. Not till after her reiterated calls have remained unanswered, does she feel herself safe, and release herself by severing the cap of the cell.

It has sometimes been alleged that old fertile queens never teet. Yet when making artificial swarms, and in other operations where much smoke was employed, I have occasionally heard old queens teet. On such occasions it seems to be an expression of alarm and anxiety. But the old queen will teet also, when, in a colony ready to swarm, but detained by unfavorable weather, the embryo queen becomes as far matured as to be able to quahk before the swarm departs. In

such cases the old queen is not always killed, or the young one torn from her cell, as the books tell us. I will cite one instance. In 1845, I heard both teeting and quahking in one of my colonies, from which no swarm had yet issued; and when the swarm left, the old queen dropped to the ground, being unable to fly. I carried her to the swarm, and after hiving, set the hive on a blackboard. Eggs were soon dropped on the board, showing conclusively that the queen was an old and fertile one.

(For the "Bee Journal.")

LARGE NUMBER OF QUEEN CELLS.

A strong stock of Italian bees deprived of their queen, being examined twelve days after, contained twenty-six perfect queen cells. A well-developed queen had just emerged from one of these cells, and three more hatched before the queen cells were removed and given to other colonies. The next day, all but six of the remaining queens had hatched; and only one of these six hatched at all. All these queens, with one exception, were of full average size; and although the hive contained an abundance of eggs, the bees evidently preferred to rear their queens from larvae.

A colony of black bees being deprived of their queen, a sealed Italian queen was given to them, and on examination two days later, the queen had hatched, and fifty-five incipient queen cells were found. These were all empty, and it is not probable that under any circumstances the bees would have perfected all of them.

The twenty-six queen cells above referred to, and most of these fifty-five, were on the bottom of the combs, the bees preferring this position as the one involving the least interference with the brood.

A nucleus, well supplied with bees, being deprived of its queen, had three royal cells given to it; and yet in a few days they had ten more under way, and four days later six more—all of which were completed.

Bees appear to be very capricious as to the number of royal cells they will build; strong colonies, in the height of the swarming season, often refusing to make as many as small nuclei. When a colony is greatly agitated at the loss of their queen, I have usually found them to build the most.

Oxford, Ohio.

L. L. LANGSTROTH.

GERMAN ADAGE.

He who hath thriving sheep in his fold,
Whose wife is not given to bluster and scold,
Whose bees are aye wont to swarm in due season,
For grumbling and growling hath surely no reason.

(For the "Bee Journal.")

Wintering Bees.

I wish to inquire through the Bee Journal (with which I am well pleased), as to the best method of wintering bees—the most difficult thing about bee-keeping, I think; or at least one of the most difficult. For two winters past I have kept my bees in a cellar; but those in Langstroth hives suffered sadly from the dysentery, whilst those in common hives were not at all affected, and very few bees died. But in the Langstroth hive they died off in great numbers, so that in the spring the stocks were very weak. This was the first winter.

Last winter, all the stocks, old as well as new, suffered from dysentery. Still, very few bees died in the old hives, but great numbers perished in the new. The first winter only the holes in the honey-boards were left open, but last winter the honey-board was entirely removed.

Now, if you, or Mr. Langstroth, or any one else, can tell why bees should die off so sadly in the Langstroth hives, whilst scarcely a bee dies in the common chamber hive, I would thank you to do so. In every other respect I like the movable comb hive much, *very much*.

It is stated in the June number of the Bee Journal, that "young queens do not usually make their hymeneal excursion until the eighth day after leaving their cells," while Mr. Langstroth says that "they leave the first day after being established as heads of independent families." "Who shall decide when doctors disagree?" Last year a queen left an observing hive on the afternoon of the second day after leaving her cell. Should like to see this question settled, if it can be.

BENJAMIN KING.

Raynham, Mass., Aug. 3, 1861.

[For the Bee Journal.]

THE FERTILITY OF THE QUEEN.

On page 109 of the Bee Journal, will be found an article, over my signature, in regard to "the fertility of the queen." I proposed, during the past season, to experiment on a plan entirely new, that the fertility of the queen might be approximately ascertained, and others were requested to experiment in a similar manner. I regret to say that circumstances have prevented me from experimenting as therein designated, or in any manner whatever. If others have done so, or have any facts to present in regard to the fertility of the queen, the writer especially would be pleased to hear from them through the columns of the Bee Journal.

M. M. BALDRIDGE.

Middleport, Niagara Co., N. Y., 1861.


[For the Bee Journal.]

ONE YEAR'S EXPERIENCE WITH THE ITALIAN BEES.

For the benefit of the readers of the American Bee Journal, I give my experience with the Italian bees this season. In the fall of 1860, I received an Italian queen, which was, of course, too late to raise queens. I therefore had but one colony this spring. I examined them frequently early in the season, and found them more industrious than the common bees, and also having more brood. On the 28th of May, coming home in the evening, I noticed a group of bees, numbering about two dozen, at one of the posts of the stand. I examined it and, behold, found the Italian queen among them. It seemed strange to me, for I did not expect any swarm at this time, as the weather was very unfavorable, particularly through the apple-blossom period. I examined the stock at once, and found queen cells, containing brood, though not finished. It was then plain to me that the bees had swarmed and the queen could not fly, I suppose on account of her burden of eggs, and had crawled up the post where I found her. I then removed a comb to start nuclei. The bees then destroyed the queen cells. On the 10th of June, I again removed a comb and found finished queen cells, which were again destroyed in consequence of the removal of a comb. I now removed the stock to an isolated place, in order to rear pure queens. On the 22d of July I again examined them, and found they had made preparations to swarm. I feared they might swarm, and no one be on hand to hive them. To remedy this I made an artificial swarm again, removing combs from the old stock (my hives contain 11 combs). Both colonies are now (Aug. 10th,) filled to overflowing, and the young stock has made preparations to swarm; at this time the old stock has also made some eight pounds of surplus honey. I am aware that greater profit has been realized from one stock, even with common bees, in a good season. But as this is a very unfavorable season with us, even worse than the last one, it is more than the common bees did. Not one stock in twenty has cast a swarm. We had no rain of any account since the 1st of June.

New Berlin, August 12, 1861.

R. B. O.

 It is stated in Vogt's Zoological Letters, that the earliest traces of petrified hymenopterous insects are found in the Upper Jura limestone; and in much greater abundance in the fresh water strata of the tertiary formations. In the latter, the ants figure most prominently. The remains of other hymenopterous insects are more rare, especially those of honey-gathering tribes. This accords altogether with the limited development and distribution of herbaceous plants and flowers in the tertiary period.

[For the Bee Journal.]

Kirby's Theory**ON THE PROPAGATION OF BEES.**

After a careful examination of Mr. Kirby's Theory, I am unable to see that he furnishes any *proof* that "the workers in their flight with the drones alight on the drones' backs,* and cause them to give off their semen, which the workers lick up and carry to their appropriate cells in their hives, for the purpose of propagating the young queens." In twenty-five years I have never seen a drone and worker falling to the ground together, and the worker busy in licking up the seminal secretions of the dead drone; nor have I ever heard of any one who has seen anything of the kind. If Mr. Kirby says that as few drones are used for this purpose, that it is not strange the process has not been seen, he not only admits that he gives us only *conjecture*, but his theory fails entirely "to account for the cause and use of so many drones."

That the workers greedily lick up the seminal matter of *crushed* drones, I have known for many years; but this is no *evidence* that they use it for impregnating the royal larvæ. If Mr. Kirby will crush some drone larvæ, in whose organs, according to his own views, the semen is not "ripe," he will find that the workers will greedily fill their honey-sacs with the milky juices. If he should infer from this that the seminal fluid is ripe sooner than he supposed, he will find that crushed *worker* larvæ are equally acceptable to the bees.

Mr. Kirby says—"The worker takes the semen thus obtained and impregnates the embryo worker-larvæ in royal cells, which fecundates the ovary of the immature queens in order to give life to her drone progeny. She then comes forth fully prepared to lay eggs that produce drones only." Is Mr. Kirby aware that queens which have had no intercourse with a drone, seldom lay any eggs at all? Or, will he say that those which do not lay were not impregnated by the workers in the larvæ state? But this will not account for the fact that, while almost every flying queen, in the season of drones, becomes able to lay both worker and drone eggs, of those whose wings are imper-

fect, or which are prevented from leaving the hive, only now and then one becomes a drone-layer.

I must entirely dissent from Mr. Kirby's assertion, that Dzierzon and Prof. Von Siebold, in their theories as to the production of drones without the male sperm, are not giving the true history." The Professor has *proved*, by actual dissection, that eggs producing drones have none of the spermathecal filaments, such as are found in those producing workers—and that queens producing such eggs only, have no seminal matter in their spermathecas; indeed, in one instance, such a queen, dissected by Dr. Barth,* had no spermatheca.

Mr. Kirby conjectures that these drone-laying queens *had* (I wish to be as indefinite as Mr. Kirby, who hazards no conjecture *how* this semen is applied,) semen gathered by the workers. Even if he could *prove* the truth of this surmise, it would only show, not that those eminent observers have not, as far as they have gone, "given the true history; but that they have failed to discover *all* the facts, and that "the generation of bees," which so puzzles the profound intellect of Aristotle, is even more anomalous than the advocates of parthenogenesis have supposed it to be.

Thus far I have attempted to show that no *proof* has been given of the truth of Mr. Kirby's Theory. I will state some facts which go far to dispose of it. In the spring of 1860, I reared a number of Italian queens, which were beautifully colored, (and whose drones have proved to be pure,) not only in combs built and occupied entirely by black bees, but *before any Italian drones had been reared*. To fully satisfy Mr. Kirby, I will give a black queen to an Italian nucleus, whose combs have been built and occupied by Italian bees, in my apiary, where tens of thousands of Italian drones are flying; and after she has deposited eggs in these combs, she shall be removed and the young queens when sealed over shall be taken to an apiary of black bees, five miles distant from any Italian stock, to be impregnated. I have no doubt that their progeny will be black bees, without the slightest trace of Italian blood.

Many readers of the Bee Journal may consider it a waste of time to attempt to refute Mr. Kirby's Theory—regarding it as a matter of no practical importance, whether it is true or false. But let such persons remember that, if true, it will require us to make important changes in our methods of breeding Italian queens.

Oxford, Ohio.

L. L. LANGSTROTH.

* In the Bee Journal for July, Mr. Kirby objects to a statement in Mr. Carey's letter in the March Number. Mr. Otis, one of the observers referred to in that letter, has since informed me that the relative position of the queen and drone was such as Mr. Kirby assumes it must be. Prof. Von Seibold has noticed this fact in his work on "Parthenogenesis." Inferring from Mr. Carey's letter, that the drone was active and the queen passive, the plan devised of tying the queen is unsuccessful, as she is too much hampered to seek the drone. It might, however, occasionally succeed, as in the case mentioned by Mr. Shrimplin, *Bee Journal*, page 66.

* This dissection was made in March, 1852. In the summer of the same year, without being aware of what was doing in Europe, I furnished a drone-laying queen to Prof. Joseph Leidy, of Philadelphia, who found her "spermatheca distended with a perfectly colorless, transparent, viscid liquid, without a trace of spermatozoa." These dissections first put the Dzierzon Theory upon the basis of perfect demonstration.

[For the Bee Journal.]

Kirby's New Theory.

If Mr. Kirby's ideas about the manner in which bees effect "the propagation of young queens" were correct, it would be impossible to preserve the Italian race pure, by any expedient, in a place where common bees are kept, and the workers have none except common drones to operate on. On his theory, all the progeny of an Italian queen so situated, must infallibly become *hybrids*. There is nothing more certain, however, than that she will, even under such circumstances, continue during life to produce pure stock; and that a young queen reared from her eggs will produce genuine Italian stock, if before fecundation she be removed to an apiary where she must necessarily have concourse with an Italian drone. She may be returned, as soon as fertilized, to her native locality, with all its contaminating surroundings; and all the seminal matter supposed to have been collected in her maternal hive, and used by the workers in "propagating" her, will be found to have had no more effect to deteriorate her than would so much water. If it had been used, it ought to have produced some effect; and that effect, according to all analogy and experience, could only have been to *hybridize* the progeny. As no such result follows, the unavoidable inference is that the supposed material which alone could be competent to effect it, (and which had it been so used, must necessarily have effected it, if it had any effect whatever,) had not been employed by the workers, in the process of propagating her.

If the young Italian queen reared under such circumstances, where the process supposed by Mr. Kirby to be the true one, would have full play, be retained in an apiary, where no Italian drones exist, and in a district where no other bees of that race had been introduced, and she be fecundated by a common drone, her worker progeny, whatever be their outward seeming, will prove to be *hybrids*; but she will to the end of her life, produce *genuine Italian drones*, and such *exclusively*. How could this be, if Mr. Kirby's Theory had the slightest foundation, since according to it, all the fertilizing matter employed was derived from common drones? Mr. Kirby says—"The worker takes the semen thus obtained [from the drones] and impregnates the embryo worker-larvæ in the royal cells, which fecundates the ovary of the immature queen, in order to give life to her drone progeny. She then comes forth fully prepared to lay eggs that produce drones only." But how comes it, then, that a young Italian queen reared as above, produces genuine

Italian drones only, if the seminal matter by which her ovary was fecundated, while she was yet immature, in order to enable her to produce drones, was derived by the workers from *common* drones exclusively? The result should, on this theory, be precisely the reverse of what ten years' experience and hundreds of experiments show that it actually is.

Let Mr. Kirby try the experiment himself, with all imaginable precautions and all conceivable variations, and he will find that a queen reared from the eggs of a pure Italian queen introduced in a hive containing common bees exclusively, in an apiary or district where no Italian bees exist, will produce genuine Italian stock, if fecundated by an Italian drone; and will continue to produce such stock exclusively during life, though he may have millions of common drones in his apiary, every year, from the time the egg from which she was hatched was laid, to the day of her death. This clearly could not be so, in accordance with his theory, since during the entire period, there would not be a particle of seminal matter from *Italian* drones procurable by the workers.

Moreover, we have frequently, in common with those who practise artificial multiplication of colonies, reared queens from eggs and larvæ taken at hap-hazard from the combs containing them; and the queens reared, after fecundation, proved to be as prolific and perfect as any bred in the natural way. Now, unless Mr. Kirby supposes that the workers impregnate with semen not alone "the embryo worker-larvæ in the royal cells," but *all* the larvæ in the worker cell likewise, must it not have been by "a most remarkable concurrence of fortuitous accidents," that we always happened to light on such larvæ as had been prepared for the transformation? This, more especially when larvæ *six days old* were taken? The regular recurrence of this in very numerous instances, must either be regarded as a fact putting a new phase on the entire "doctrine of chances," or force us to the conclusion that the seminal matter *supposed* to be stored up in the cells, (*should any ever be found there*;) is designed for some more general purpose than simply that of being used for "the propagating of young queens;" for tens of thousands of workers are bred in colonies in which not more than one or two queens are reared in a season in the natural way, and even in many, where none are reared.

Instead of explaining what to him, seems a mystery in the reproduction of the honey bee, and giving us the "true history," which Dzierzon and Prof. Von Siebold are alleged to have missed getting at, Mr. Kirby only originates a profounder puzzle. A brief experience in the rearing of Italian queens, will convince him of his error, and satisfy him that his theory is untenable; though it may fail to convert him to that of others.

L. P.

[For the "American Bee Journal."]

Who will Explain the Mystery?

One of my beekeeping friends, the past season, divided a colony of bees as follows: three of the central combs, with the adhering bees, containing an abundance of brood in every stage of development, were selected and transferred to an empty hive. The vacancy in each hive was filled with empty comb-frames; the parent colony was moved a short distance to a new location, and the new one placed on its stand. The old queen was permitted to remain with the parent colony. A large number of bees returned to the parent stand, so that the new colony was very populous. The queenless colony soon commenced operations to supply themselves with a queen. In the meantime, as the honey season was very favorable, they gathered large stores of honey and, consequently, built considerable comb. They filled all the frames nearly with comb, which, of course, was principally of the *drone* or *store* kind. By the way, allow me to state, that this method of dividing bees is wrong; the old queen should have been given to the new colony—*worker* instead of *drone-comb* would then have been constructed. Instead of taking *three* combs from the parent colony, only two should have been taken; the combs in the parent colony ought then to have been moved from either side towards those on the other, and the empty frames put into the side of the hive left vacant. It would then have been good economy to have supplied the parent colony with a royal cell having a queen nearly mature. There are objections to this mode of dividing bees even when the foregoing precautions are strictly observed. Space, at this time, forbids my entering into particulars as explanatory of the objections. I trust that I may arrest attention, however, by stating that the best mode of division yet originated, in my opinion, is very similar to that advocated by S. C. Brown, on page 137 of the Bee Journal. That method is *practical*; can be practiced with the best of success by nearly all classes of beekeepers!

We will now direct our attention to the divided queenless colony under consideration. Nineteen days after the division, myself and others made an examination and found the young hatched queen. She was apparently in good condition; there was no indication, however, that she had, as yet, been impregnated. A frame of newly made *drone-comb* was then taken out for inspection, when to our surprise we found a *royal cell*, nearly ready to be sealed, containing *larva*! After a diligent search, we found there were no eggs nor

larvæ in the hive, aside from the larva in the royal cell. This cell was constructed on the *side* or *surface* of the *drone-comb*. The inquiry was then made, how came the egg, from which the larva in the queen cell originated, deposited in the *drone cell*? I do not propose to give a decisive answer to this inquiry. In my opinion, it would be very imprudent to do so. As the problem in question is of a very interesting nature, I trust I may be justified in making a few *conjectures*. Circumstances were such that it is not known whether said larva would have matured as a *queen* or a *drone*. Had it matured as a *drone*, probably the egg was deposited by a *fertile worker*; but, as a *queen*, it might possibly have been *transferred* to the *drone cell* from some other colony standing near! It is well known by those engaged in the propagation of the Italians, that the bees are frequently found passing in and out of neighboring *native* colonies without the slightest molestation I presume, if the fact were known, that the native bees pass in and out of the hives of each other in a similar manner; if so, it seems to me that it would not be an improbable occurrence should they, in visiting their neighbors, instinctively prepare for an emergency, select an *egg* and transfer it to their own domicile. It seems to me, however, had the egg been transferred, that their instinct would have taught them to have deposited the egg in a *worker cell*. It would, probably, have made no difference in regard to the successful rearing of the larva as a *queen*, as the egg selected would very likely have been from a *worker cell*, and, of course, properly fertilized. Who will propose a better solution to this interesting problem, or, in the words of the heading to this article, "Who will explain the mystery?"

M. M. BALDRIDGE.

Middleport, Niagara Co., N. Y., 1861.

☞ Young queens make their excursions only while the bees are disporting in front of the hive, and the joyous humming then heard is supposed to prompt or rather allure them to issue. Though the weather be calm and warm, and in all respects favorable, they leave at no other time.

☞ The old notion that drone eggs are developed periodically only in the queen's ovary, has long since been exploded. So also the conceit that drone eggs proceed from one branch of the ovary and worker eggs from the other.

Colonies which have royal cells so far advanced as to be capped, cease building comb for a time.

Bee Culture in Common Hives.

No. III.

BY F. W. GUNDELACH.

Colonies which are populous and in good condition in the fall, or were properly strengthened and duly provisioned then, will generally be ready for swarming by the middle of May, or towards the close of that month. Such is the case when the bees have so multiplied that there is no longer sufficient room for them in the hive, and the cells are almost exclusively filled with brood. Many of them will then be constrained to cluster outside during the night. Want of room thus excites in them the disposition to swarm; royal cells are built, and these are usually capped at the close of the eighth day, or early on the ninth—the enclosed larvæ being then ready to pass into the pupa state.

If the weather is favorable and pasturage plentiful, the swarms will issue at about this period, and commonly leave between 9 o'clock in the morning and 3 o'clock in the afternoon. They generally cluster on some neighboring tree or bush, and are then ready to be secured and hived. If the process were always uniform and so simple as here sketched, it would, in most seasons, be sheer folly to be at the trouble of making artificial swarms. Unfortunately this is not the case. Thus if, after the royal cells have been capped, continuous rainy weather should occur, or if pasturage should suddenly fail, bees lose their swarming propensity and destroy the royal cells; and though, from want of room, they continue to hang out for days and weeks in succession, no swarm will issue. The drones, indeed, will be retained, and if as numerous as they frequently are, in the spring, in common hives, they and the involuntarily idle workers will consume a large amount of stores.

But, though the swarm, accompanied by the old queen, take its departure, the result is not always as satisfactory as was anticipated. "There's many a slip betwixt the cup and the lip!" It sometimes happens that the old queen, unable to fly, falls to the ground and is lost. The bees still settle in a cluster, and the swarm is quickly hived. But the workers soon discover that the queen is missing, and incontinently "take French leave," hurrying back in hot haste to the parent hive. Many bees are always lost on such occasions, and if the old queen be not afterwards found, or the apiarian does not know what use to make of her if found, the resulting disadvantage is very considerable, for in the spring a fertile queen is nearly

as valuable as a swarm. These risks are avoided, when forced swarms are made, besides saving the necessity of long and anxious watching for the departure of first swarms, about which there is always great uncertainty. My apiaries have always been situated more than a mile from my dwelling, yet in the thirty-five years during which I have kept bees, I have not lost a single swarm. I have prevented such loss by regularly driving out the first swarms every spring, and then awaiting the coming of the second swarms, the issuing of which can always be foretold with reasonable accuracy.

From these considerations, I prefer forced to natural swarms, particularly because they involve so much less trouble and anxiety than the watching, securing, and hiving of natural swarms. I usually drum out a half dozen swarms in the course of as many hours, always selecting the most populous stocks for the first operations. It is not necessary to wait till the bees begin to cluster outside in large numbers. I regard a stock as ripe for driving when, on lifting the hive at dusk in the evening, I find the bottom board well crowded with bees, being then satisfied that there is no longer sufficient room for them between the combs. I then commence operations, continuing the process at intervals of from two days to a week, according to the number of stocks I have, and the condition in which they respectively are. On the preceding evening, I raised the hive slightly from the bottom board by inserting three or four thin wooden wedges, elevating it high enough to allow a free passage for the air all around, but not so high as to permit a bee to pass out. The ventilation thus effected reduces the temperature of the hive during the night, and the bees consequently withdraw from the bottom board. The driving is undertaken next morning, or at any convenient time on the following day; and as my method does not differ essentially, in any respect, from that generally adopted, and frequently described in bee-books, I will not go into details here.

When the queen promptly accompanies the expelled bees into the upper or receiving hive, the whole operation may be finished in from twenty to thirty minutes. But as she sometimes fails to do so, I will mention the means I use to secure her expulsion. I mix equal parts of oil of turpentine and oil of rosemary in as much pure alcohol as will dissolve it without becoming more than slightly milky or discolored. Of this mixture I pour fifteen drops in the bowl of a new clay tobacco pipe, the stem of which I insert in the hive through a gimlet hole close to the now

inverted top; and then surrounding the bows with my lips I breathe gently through the pipe, thereby diffusing the fumes and odor of the mixture through the hive. If gentle beating of the exterior of the hive be then resumed, the queen will in almost every instance immediately join the forced swarm above. If on separating the hives, the bees remain quiet and contented in the new one, for half an hour before it is placed in the apiary, we may conclude that the queen is among them. Or, if the queen is fertile, we may speedily ascertain her presence, by setting the hive on a blackboard. If she is in the cluster, eggs will soon be seen on the board, as there are in the hive no cells in which she could deposit them. As soon as I find eggs on the board, I carry the new colony to the place where the old stock stood, setting the latter in some other spot. But I prefer, when it can be done, to replace the parent stock on its old stand, and sending the new colony to a new location at least a mile and a half distant from my apiary. Repeated trials of both modes have satisfied me that this is the best.

If eggs are not found on the blackboard in the course of fifteen minutes, I replace the receiving hive on the parent stock, introduce another dose of the mixture, and recommence beating or patting gently. If after this I still find no eggs on the board, and the expelled bees remain quietly clustered in their new hive, it is probable that they have a young and still unfertile queen, and the better course will be to reunite the bees. This, however, will scarcely happen in one case in a hundred, in May.

If circumstances constrain me to retain the driven swarm in the apiary, I either set it where the parent hive stood, removing the latter to some other place—which is the least troublesome, and for a new beginner the safest method; or I place it at the side of the parent stock. In the latter case, after being satisfied that the queen is with the swarm, I set the hive for a few minutes, where the parent stock stood, after removing the decoy hive, so as to give the stragglers an opportunity to join the swarm; and then carry it to a cool, dark cellar, where I leave it till the evening of the next day, having first closed the entrance to confine the bees, and given them air by inserting a thin wedge between the hive and the bottom board. I then replace the parent stock on its stand, to receive any bees that may still be out. The workers, missing their queen, will almost immediately begin to construct royal cells, and will by morning be fully reconciled to their orphanage. Next evening, at dusk, I place the driven stock at its side, and open the entrance. Should I find in

the course of the following day, that a large number return to the parent hive, I move this six or eight inches further to one side, bringing the swarm nearer to the old location, and continue this till I find that a strong colony remains with the queen—which can generally be properly adjusted in a day or two.

In from twelve to fourteen days the young queens reared in the parent hive will be mature. Usually only one of them leaves her cell and by her *teeting* restrains the rest from emerging, though by their responses (*quahking*), they announce their readiness to come forth.—Some writers recommend the driving out of the second swarms also, with a view to secure the supernumerary queens, to be used in making artificial colonies. I cannot advise it to be done, because it is an exceedingly troublesome task to seek for the queens among a mass of bees; and we, moreover, incur the risk of exposing the parent hive to queenlessness. It is, besides, not possible always to make an artificial colony, in this manner, without confining the bees at least twenty-four hours, for we may not happen to give them the queen which had first emerged, and to which they had become accustomed. And how little they are disposed to receive and acknowledge a stranger, may readily be discovered by removing a strong stock from its stand, and placing there an empty hive with a queen confined in a cage. The returning bees will course about rapidly and anxiously in the hive, hurrying around and over the cage, wholly regardless of the imprisoned queen. They will seek everywhere for the one to which they have been accustomed, and failing to find her, will finally desert the place, dispersing and entering other stocks, rather than accept the offered queen. But if, when a swarm issues naturally, the queen happens to fall to the ground, and the bees return to the parent hive, we place her in a cage, suspend it in a hive and substitute this for the hive from which the queen issued, the result will be essentially different. The returning bees will at once collect and cluster about the cage, in all respects like a natural swarm, simply because they recognize and acknowledge the queen. Second swarms are notoriously more restless and discontented than first swarms, and it is merely because they feel a less ardent attachment to a young and yet unfertile queen. If *teeting* has been heard for several days before the second swarm issues, the bees will manifest a less discontented temper, because they have meantime become somewhat accustomed to their queen.

For these reasons, I disapprove of driving out second swarms and never practise it. But I

every season rear a number of reserve queens in nuclei, so as to have them in readiness when needed to supply queenless colonies. This I regard as highly essential to successful bee culture in a large apiary. Long experience has taught me that of every ten young queens which leave on their wedding trip, one is certain to be lost; and I therefore endeavor to have on hand one reserve queen for every eight yet unimpregnated queens in my apiary. It is always a waste of precious time, and most generally a bootless labor, to impose on a queenless colony the task of rearing a queen from inserted worker brood, as a long period must elapse before young workers make their appearance to reinforce the ever-diminishing population, and the season passes before the colony recovers.

[For the Bee Journal.]

NEW MODE OF HIVING BEES.

Does not the new method of hiving bees, as recommended by Mr. Langstroth in the August number of the Bee Journal, involve an unnecessary amount of labor? I see no necessity for moving either of the hives, or for covering the parent stock with a sheet. My hives are arranged beforehand, sometimes two weeks before the swarms are expected. They are placed where they are intended to stand permanently, and the hives as well as the frames are plumbed with a plumb-line, from side to side, allowing about a couple of inches descent from rear to front. When the swarm issues, the queen having her wings clipped will be found very near the front of the hive, generally surrounded by a cluster of bees from the size of an egg to that of a peck measure, so that there is no difficulty in finding her. I take her up gently and place her in the top of my hiving box, and then either shake the bees into the box, or, if they have settled too high for that, I elevate the box on a pole, and hold it near the swarm. When they have all entered, I take them to the hive prepared beforehand, and empty them on a sheet at its entrance.

With my present experience, I am inclined to prefer allowing bees to swarm naturally, subject to the above restrictions, if they will do so. When they are strong enough to swarm and will not, the case is different. I always endeavor to secure at least one good comb for the centre of the new hive, for the queen to commence laying in, without having to wait for new comb to be built. I also remove the queen cells from the parent colony, or the young queen if she has hatched, and give it a fertile queen from a nucleus, giving the nucleus a queen cell in exchange.

Hulmeville, Pa.

C. W. T.

[For the Bee Journal.]

TO PREVENT ANTS FROM DISTURBING BEES.

MR. EDITOR:—I hear a great deal of complaint of ants disturbing bees, and occasionally inquiry is made as to the best remedy; but have not seen or heard of any remedy so certain to "head" the little intruders, as a simple plan which I adopted five years ago in my apiary.

It is this:—I make benches of 1½ inch boards, having the feet to project out, but very slightly, so as to prevent being easily blown over. I decide where the bench is to stand, and see where the feet will come, then put narrow boards crosswise for the feet to rest on. Under each end of these boards, I sink a block of wood or a stone, so that it shall not settle in wet weather. Then place the feet in tin, earthen, or iron vessels, (no matter how rough; even old oyster cans will do,) and fill with water about once a week. See that the bench does not touch any other thing having connection with the ground.

I brought in from the country this spring, two hives of bees (Hall's patent), set them on one of the above described benches in my bee house, and in a few days opened the upper doors to inspect the honey boxes. I found in and around the boxes, thousands of big black ants and eggs. I brushed them out for two or three days in succession, and since then not an ant is to be seen in them, or in any other hive in the apiary.

Marion, O., Aug. 5, 1861. T. J. MAGRUDER.

[For the Bee Journal.]

About the middle of May, I transferred a colony of bees to one of Langstroth's movable frame hives, and for about three weeks they appeared to do well. About the middle of June, they commenced killing the young bees—apparently perfect and active bees. They pulled them out of the hive, and some they killed and dropped in front of the alighting board; others they carried away.

I have examined the hive and have found nothing the matter. They have built considerable new comb, the greater part of which is filled with brood. They are free from worms also. As they have about quit working, I fear they will go down entirely, unless something can be done to stop the murdering of their young. I hear several beekeepers in this vicinity complaining of the same trouble with their bees.

Any information through the Bee Journal, as to the cause of this difficulty and a remedy for the same, would be gratefully received by a young beekeeper.

J. S. MARTIN.

Flat Rock, Ohio, July 13, 1861.

[For the Bee Journal.]

Does the Swarming Impulse proceed from the Queen, or from the Workers?

A nucleus well supplied with bees and honey, and having a queen a week old, deserted its hive. As no eggs had been laid by the young queen, a comb with eggs and larvæ was given to them when the bees were returned. The next day they issued three times, and the day after once, early in the morning. Then their queen was given to a nucleus rearing queens, and her place supplied with a sealed queen cell. The queen remained contented in her new home, and as she began to lay eggs the next day, she must have been impregnated* before her last swarming. The early hour in the morning at which the bees left for the fifth time, precluded the idea that the bees left—as they sometimes do—to accompany the queen on her wedding tour. The nucleus from which this queen was taken, swarmed again the same day, uniting with another nucleus which had deserted its hive.

These facts show that, in this instance, the workers were the active agents in the determination to seek a new home.

L. L. LANGSTROTH.

*I have usually found eggs in the comb, in about 48 hours after the impregnation of a queen. In one instance, this summer, the queen did not begin to lay until four days, and in another instance not until five days after I found them on the comb with evidences of impregnation.

Huber concluded, from his own observations, that the queen incites the bees to swarm, by her uneasiness and alarm, and by an incessant courting to and fro on the combs, thereby producing commotion among the workers, terminating in a sudden rush to the entrance and a precipitate departure of the swarm. To test this, Gundelach confined the queen of a strong stock at the swarming season. Still, a swarm left in due time, though it speedily returned and re-entered the hive. Dr. Dönhoff also made repeated experiments with small nuclei, each consisting of a queen and a few hundred workers—the queen being confined in a cage. His primary object, however, was to test the effect of introducing a very fœtid oil in the combs; having on a previous occasion noticed that when such oil was applied to a comb, the bees immediately deserted it. He intended making the experiment at noon, on a fine day; but at 11 o'clock the bees of one of his nuclei swarmed out. Not a bee remained, and the queen moved about very unconcernedly in her cage. The bees soon returned, and in fifteen minutes were as quiet and seemingly as contented as if they had never left. At half past eleven, he poured some

fœtid oil on the combs of another nucleus. The bees instantly retreated and gathered in small clusters in various parts of the hive. At 2 o'clock in the afternoon, the whole body issued and clustered, in detached parties, on a neighboring tree. The queen seemed content and unaffected in her cage. In a short time the bees returned, and many of them repeatedly entered the hive, but were evidently repelled by the odor of the fœtid oil, and finally they dispersed, forsaking the queen and joining other colonies.

Whence did the swarming impulse emanate in these instances? Certainly not from the queens, thus circumscribed in their movements and wholly unagitated and passive. Manifestly it could have proceeded from the workers alone.

Dzierzon is of opinion that the swarming impulse is not communicated by the alleged restless and uneasy movements of the queen, as Huber supposed; because an old and decrepid queen, unable to fly and scarcely able to crawl about on the combs, such as sometimes accompanies a first swarm, is not likely to possess sufficient physical strength or vigor to make the requisite exertions, if such were necessary. How, moreover, he asks, could a queen know the state of the weather, so as to be sure that the propitious moment for swarming had just then arrived? As the mature virgin queen is prompted to make her wedding trip by the joyful hum and turmoil of the disporting bees, instead of furnishing the incentive for such disporting, so the queen is led to join the issuing swarm by the bustle and commotion of the workers. He adds, "I once caught and removed a *teeting* queen at 7 o'clock in the morning, and at noon an after-swarm issued, though there was then certainly no mature queen in the hive, as was evident from the speedy return of the swarm. Here the bees had certainly issued without any prompting from a queen, but in the confident expectation that the one I had taken away would accompany them—her removal having doubtless not been discovered by them prior to the swarming."

Notwithstanding all this, Dzierzon suspects that the primary impulse to swarming proceeds from the queen, though not from the uneasiness and restlessness which she manifests, but from the tones of anxiety and apprehension which she from time to time emits. These apprise the bees of the impending necessity for an early emigration, and that delay might endanger the queen. Confinement of a queen has no bearing on the case; for as a queen incapable of flying will still issue with a swarm, unconscious of her disability, tho' she fall to the ground a dozen times, so a

confined queen is not conscious that she cannot leave the hive, though fully conscious of impending danger, and may, in consequence of her uncomfortable situation, all the more urgently endeavor, by *teeting*, to induce the bees to swarm.

When all things are ready, and the resolution to emigrate has been formed by both workers and queen, the immediate incitement to leave may still proceed from causes wholly irrespective of either party. It may be produced by a swarm then issuing from some neighboring colony. This is quite natural, and it is by no means unusual, in the swarming season, for several swarms to issue simultaneously from different colonies when one has left. They are tempted forth by the peculiarly attractive tones emitted by the first: which likewise not unfrequently induce a swarm already hived to take wing again. Such are Dzierzon's views.

PLEASE GIVE CREDIT.

We find a large number of our original articles copied into other Journals without proper credit. We presume it is scarcely necessary for us to say that this is a direct violation of editorial courtesy. We are scrupulously careful to credit all the articles not prepared expressly for the Bee Journal; and therefore feel that we have a right to ask a similar recognition of our rights at the hands of our editorial brethren. Will those who have been appropriating our articles, please take the hint?

The year 1860 must be regarded, taking "the world round," as the poorest honey year of the present century. California and Australia excepted, failures and losses are complained of everywhere. In Poland, Hungary, and Germany, it is designated as the unpropitious, and in France the calamitous year. In England a large number of colonies in common hives were lost, and in some districts entire apiaries destroyed. The result is generally attributed more to the insufficiency of the supplies which the bees were able to collect during the previous summer and fall, than to the severity of the last winter.

NOVEL EXPERIENCE.

A young man named Hunter, living some six miles east of Polk City, on the prairie, where trees and fences were wanting, was the other day placed in a rather trying position. A large swarm of bees seeking a resting place, settled upon his person, completely covering his legs and body. In this condition he walked to the house, some 100 rods distant, where, obtaining a box, the bees were successfully hived, without injuring him.—

Des Moines Journal.

[For the "Bee Journal."]

THE QUEEN'S FERTILITY.

I think the Baron of Berlepsch, in stating the number of eggs which a queen-bee may lay in a day, names a lower figure than the data, in the case of which he speaks, justify. He says, his double stock was introduced on the 10th of June, and the counting took place on the 28th, when 38,619 cells were found occupied by eggs and larvae. This number he divides by 21 days, being "the average time required for the maturing of a worker." But as the eggs had been laid within 18 days, and the queen moreover had only inadequate accommodations on the first day, and the counting took place before the close of the last, it seems but fair to deduct one day from the term, and 17 days assumed as the full period of oviposition. This gives 2271 eggs as the average number laid per day, instead of 1839, or nearly twenty-five per cent. more. I do not doubt in the least that, had the colony been introduced in a hive completely furnished with empty combs, the number of eggs laid per day by the queen, would have fully equalled Dzierzon's estimate.

T. C.

[For the Bee Journal.]

THE AMERICAN BEE JOURNAL.

Everybody is speaking in the highest terms in regard to the intrinsic value of the American Bee Journal. It is admitted to be the periodical that has so long been needed by the Apianians of this country. Editors of the Agricultural papers are beginning also to appreciate its worth. They can now make good and judicious selections respecting the management of bees, thus benefiting their apicultural readers more than they possibly could by the publication of the *milk-and-water* articles with which they are frequently favored. The American Bee Journal merits, and, therefore, justly deserves a permanent existence. I trust that the Agricultural Editors, as well as the editors of other periodicals, will continue to manifest a willingness to lend a helping hand in sustaining the only American Bee Journal, and thereby advance the bee interests of this country.

M. M. BALDRIDGE.

Middleport, Niagara Co., N. Y., 1861.

He who wishes to improve the bee pasturage of his neighborhood, should not neglect to plant maple, locust, chestnut and linden trees on his own premises, and encourage others to follow his example. The tulip, poplar, sugar maple and horse chestnut make much finer shade trees for towns and villages, than the nauseous *Ailanthus*.

[For the Bee Journal.]

Queens' Excursions.

A great diversity of opinion exists as to the time when the first excursion of a young queen in quest of drones for impregnation may be looked for. The June number of the Journal (page 130.) states the time at from the fifth to the twelfth day after issuing from the cell. I think this is a mistake; at least it has not been true with me.

I have practised *artificial swarming* exclusively, and make a record of the facts: The queen may be *confidently* looked for issuing from the hive, between noon and half-past two o'clock, P. M., or the second fair day after emerging from the cell—frequently on the first, and if drones are abundant, she usually meets them after one or two flights.

A practised eye will readily recognize the marks of impregnation with which she returns when successful; and in from two to ten days thereafter she will generally be found depositing eggs in the cells. One queen which issued from the cell on the 4th of July, took wing on the 5th, and had deposited quite a quantity of eggs on the 7th. Out of six which issued on the 26th ult., three became fertile on the 29th, two on the 30th, and one on the 1st inst. These are instances of the *earliest* fertility, however, I have ever known. It is accomplished in the following way, viz: *by permitting only one queen cell to remain in the hive.* In rearing queens, I always use *small clusters* only. If more than one queen be allowed to mature, and the swarm be large, the bees are apt to *cluster around and imprison the queens*: besides this, the queen will destroy all surplus cells before leaving; which, it is imagined, delays her impregnation. I have known the bees thus imprison a queen for *ten days!* By allowing *only one* royal cell to remain in the hive after the tenth day, no such result will ensue. The only difficulty in thus rearing queens by small clusters, in warm weather, is the greater liability of the bees to take flight with the queen when she seeks the drones, and then leave for the woods. This source of vexation and anxiety, is avoided by taking the precaution of having some larvæ or capped brood in the cells at this time. The bees will not then desert their nurselings, and the queen will return—except an occasional one. A few will be lost by accidents, such as being destroyed by birds, &c., to which risk *all* queens are *once* exposed.

MARTIN METCALF.

Grand Rapids, Michigan, August 4, 1861.

There is greater diversity in this important matter than is commonly supposed; and observers

may differ widely in their statements and inferences, while each narrates the facts correctly. Circumstances exert a controlling influence and materially affect the result. Thus, queens reared in small nuclei, such as our correspondent uses, will certainly issue earlier and usually become fertile sooner, than such as are reared in larger colonies: and the seasonable removal of all surplus royal cells, will efficiently contribute to bring about the desired consummation. On the other hand, the young queen of a populous colony, whose hive was *full of comb*, well supplied with brood and honey, has been known not to be impregnated, though drones abounded, till more than three weeks after she left her cell. The truth seems to be, that there is no definite term—circumstances governing in every case.

[For the American Bee Journal.]

I would like to inquire through the Bee Journal, if it is a sure evidence that an Italian queen is not pure blood, when some of her young queens are dark-colored? I have one that I supposed to be pure, but occasionally a dark queen hatches from her eggs. As I have made an inquiry in relation to queens, I would like to say a few words about bee hives. Not wishing to say anything against any one's hive, nor to injure any one's feelings, I have used Rev. L. L. Langstroth's bee hive three seasons, and am fully convinced that it is the best hive in use; and I can highly recommend it to others.

Those who use it, need not feel afraid of being held liable to other parties for infringements, as Rev. L. L. Langstroth is the original inventor of the movable frame. C. B. BIGLOW.

Perkinsville, August 13, 1861.

In the Model Apiary belonging to an Apian Society at Nurstadt, in Germany, under the superintendence of Mr. Langbein, twenty-six colonies in Dzierzon hives and managed on the Dzierzon system, produced 1300 lbs. of surplus honey in 1857. Three colonies belonging to Mr. Hoffmann, produced 180 lbs; and fourteen colonies belonging to one of his neighbors, produced more than 500 lbs.

We have received a communication from a correspondent at Granville, Ohio, respecting the [supposed] difference of structure in brood and store comb. His observations, though original with him, are not new, and the seeming fact is susceptible of easy explanation. But his letter was received too late to permit further notice now.

The Italian Bee.

Mr. F. A. DEUS, of Dusseldorf, who was a member of the German Apiarian Convention, at Mayence, in 1855, made a tour through a part of France, Switzerland and Italy, immediately after the Convention adjourned. He was accompanied by three other members of that body, and communicated to the *Bienenzeitung*, the following account of their search for and observations on the Italian bee.

"No trace of Italian bees could be discovered by us, on our route from Lake Biel onward through the valley of Chamouni, though common bees are kept in this valley during the summer, even as high up as within a mile of the Mer-de-Glace, where they produce a beautifully clear and highly aromatic honey from the nectar of the fragrant Alpine flowers. The custom of apiarians there, is to kill all their bees in the fall, as the winters are too severe and protracted to permit them to be kept over with advantage. Fresh supplies of swarms and stocks are procured every spring, from the warmer valleys in the vicinity of Geneva.

On entering Italy, we found neither bees nor beekeepers in the districts of Chambery and Turin, nor along the route of the railroad thence to Genoa. But at the Villa di Negro, near the latter city, the genuine Italian bee exists in all its beauty and perfection. It was delightful to observe the celerity, agility and grace displayed in all their motions by the busy workers, as they rifled the flowers of their sweets. Their bodies were so slender and delicate, their colors so bright, and their markings so clear and distinct, as to surpass greatly any specimens of the race which had previously come under our notice. We caught a number of them, and preserved them in alcohol for future comparison. We did not succeed in finding any apiaries—the gardens of Genoa being chiefly surrounded by walls so high as to prevent intrusion.

We hoped to discover Italian bees while travelling with a vetturino to Nizza, along the shores of the Mediterranean; but were again disappointed. Not an apiary was seen in a three days' journey through a delightful country, crowded with small towns and villages. On our arrival at Nizza, we were mortified to find only the common bee prevalent there. It is hence evident that the Italian bee is not a mere climatic variety, but really a distinct race. We were repeatedly assured also that the common kind only was found in the Kingdom of Naples and in the warmer districts of Upper Italy. We chanced to fall in with a beekeeper from Normandy, who

informed us that two kinds of bees were cultivated in that country—the common kind and also a yellowish or orange variety. The latter, he stated, were much preferred, as being more gentle and more industrious. The common kind, he said, were particularly irascible and wild. This account likewise corroborates the opinion that the Italian bee is not the common insect modified by special climatic influences, because Normandy differs little in that respect from Central Germany.

At Lago Maggiore and Lago di Como, we found Italian bees exclusively, and of the most perfect type, like those of Genoa. These districts, indeed, appear to be their chief *habitat*."

VITALITY OF SPERMATAZOA.

At a meeting of the Austrian General Agricultural Society, Mr. Hoffmann, of Vienna, reported to the Section on Bee-culture, the results of some further experiments made by him with spermatazoa, taken from the spermatheca of a queen bee. These show that the vitality of the spermatazoa is exceedingly tenacious. He kept some immersed in cold water 71 hours, and found that they were still alive and active on being placed in a moderately warm temperature. Even spermatazoa taken from a recently-killed queen, moved freely after immersion in cold water for ten hours. Nay, spermatazoa exposed on the glass plate of a microscope and allowed to become dried, exhibited motion again on being wetted and placed in a warm temperature.

FEEDING BEES ON SUGAR-CANDY.

This is a discovery of the utmost importance. It has been ascertained by actual experiment that a few pounds of sugar-candy will (particularly in the Langstroth hive) preserve a colony from starvation. The candy may be purchased at a confectionery: the plain is preferable, but hoarhound or lemon will do: it is made in slats about an inch wide and a quarter of an inch thick, and laid on top of the frames, just below the honey board: a few sticks may be stuck amongst the bees. It, or loaf-sugar, may be pulverized and rubbed in the combs. From two to four pounds, according to the condition of the hive, will effectually prevent a colony from the perils of starvation. Full directions how to prepare the candy, will be found in Mr. Langstroth's work.

☞ Bees which are really dead, will always be found to have the proboscis protruding. When this is not the case with bees apparently dead, they may be revived by sprinkling them with diluted honey or sugar-water, and placing them in a warm room.

[From the "Bienenzeitung."]

Can Bees Hear?

Whether bees can hear or not, is still an open question. Dr. Dönhoff says—"that bees can hear, may fairly be inferred from the teeting and quahking of young queens. Whoever has listened for fifteen minutes to the calls and responses, cannot fail to regard them as proof positive that bees can hear." I freely admit that this, if anything, might warrant such inference; but still cannot concede that it furnishes "proof positive" of the fact.

Bees undoubtedly possess means of communicating with each other. Because their utterances are audible to us, and seem, in many instances, susceptible of intelligent interpretation, we are ready to regard and speak of them as their *language*. But it does not follow, that the bees themselves apprehend these utterances "by the hearing of the ear." There are various other nervous media of communication by which their sensorium may be reached and affected. All the sounds emitted by them, teeting and quahking included, are accompanied by motions of the wings, and produce concussions or vibrations of the air, which obviously influence the acute nervous sensibility of these insects. And it seems singular that they are affected by these utterances, with few exceptions, only within their hive. External and foreign sounds appear to make not the slightest impression on them. The clangor of trumpets, the report of fire-arms and the deafening crash of thunder, do not affect them in the least perceptible degree, either within or out of the hive. Yet the slightest touch of the bottom board, or the gentlest tap on the hive, is instantly responded to by a brusque buzz throughout the entire colony. The question whether they can hear is, consequently, interesting not alone to the beekeeper, but to the physiologist also, and well deserving of scientific investigation. The antennæ have been regarded by some, as organs of hearing; and as articulated members, extending freely in the ambient air, they would seem to be peculiarly adapted to take cognizance of the faintest pulsations of the air, and receive impressions from every wave of sound. But the question still recurs, does the sound act simply on the sense of *feeling*, or do the antennæ include special auricular nerves?

KLEINE.

A German treatise on bees, published in 1692, says—bees are fond of music; when one flies about your head threateningly, *whistle a merry tune*, and it will immediately become pacified!!!

[For the Bee Journal.]

Development of Queen Bees.

MESSRS. EDITORS:—In the June number of the American Bee Journal, Mr. Langstroth stated a case of "slow development" of a queen bee. Several similar cases have come under my notice. In the last case which attracted my attention, several queen cells had been *sealed over* before the construction of the last queen cell *was commenced*. I did not note the precise time which elapsed from the laying of the egg to the maturity of the last queen, but it must have been about three weeks. In all such cases which I have noticed, the eggs from which the last queens were reared, were allowed to remain unhatched for several days after the others had been hatched.

On the 24th of June last, I removed an Italian queen from her hive. Some ten or twelve queen cells were built. On the 3d of July (*just ten days after the removal of the old queen*), on examining, I found two or three young queens had already emerged from their cells, and the workers were busily engaged in tearing open most of the remaining royal cells.

Again, on the 29th of June, I removed the queen from another hive. On the 9th of July, I found two newly-fledged queens alive (some three or four others had been hatched), and the remaining seven or eight cells were in process of demolition by the workers.

In both these last cases, either the eggs from which the developed queens were reared, must have been laid *six days* prior to the removal of the queen, or the bees must have developed them in less than their usual period of sixteen days. Doubtless the former was the real state of the case.

Baltimore.

R. C.

☞ We have received a copy of "*The Beekeepers Directory*," by J. S. Harbison, of Sacramento, California. It is a volume of 440 pages, with 81 illustrations, generally well executed. We have had leisure only to give it a cursory perusal. The practical portions of the work, especially those based on the personal experience of the author, are very good, and are a valuable addition to our English bee literature. From much of the theorizing, however, we are constrained to dissent.

If bees intentionally discard their old queen in the spring, they generally build three or four royal cells, in their anxiety to rear a successor, and diminutive swarms may then issue at an unusually early period.



AMERICAN BEE JOURNAL.

Philadelphia, September, 1861.

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NEW FOREIGN PUBLICATIONS.

Ten years ago, the press of Germany used to teem with catchpenny bee-books, from the pens of the Breyers, Von Reiders, and other professional compilers, who suited their productions to the market for which they were intended—the gullible portion of the public. But all that has been changed there, by the general diffusion of information in the community, of which work, the "*Bienenzeitung*" has been the principal and most efficient medium. The works which now appear are of a higher order. Though few in number, by their intrinsic merit they effectually suppress the multitudinous small fry which formerly filled the land.

Three highly valuable and comprehensive works have made their appearance in Germany within the last twelve months. The first of these is a treatise on "*Bee culture in poor honey districts*," by the Baron of Berlepsch. It is a royal octavo volume of 475 pages, with numerous wood cuts; and though from its title, its design would seem limited to a special purpose, it embraces the whole subject of bee management, and discusses very thoroughly whatever in the natural history and physiology of the bee has a bearing on practice. A chapter on "*the sexuality of bees*" was written expressly for this work by Professor Leuckart, of Giessen, of which we purpose furnishing a translation for an early number of the Bee Journal.

The second work is a revised, systematized and condensed republication of the *Bienenzeitung*, giving, in a connected form, all the valuable material contained in the sixteen volumes of that valuable periodical. Dzierzon's communications, for substance, yet in his words, constitute the text; and the contributions of other correspondents, discussing various topics, and also those sustaining or impugning Dzierzon's peculiar tenets or teachings, are appended as foot notes, in small type and double columns. The first volume, a copy of which has reached us, is beautifully printed, contains 611 large octavo pages and 42 illustrations on seven lithographic plates, and is embellished with a faithful likeness of Dzierzon. This volume is devoted to the theory of bee culture, as illustrated in the pages of the *Bienenzeitung*. The second, which we expect to receive shortly, will embrace the practice, as described and explained in the same Journal. The two will constitute an invaluable treasury of apiculture and apicultural science, such as the Germans may well be proud of, and which cannot but give a renewed impulse to bee culture among them, now that the earlier volumes of the *Bienenzeitung* are out of print and can rarely be procured.

The third work is Dzierzon's most recent production, entitled "*Rational Bee Culture*." This is an entirely new treatise, prepared specially for the use of practical apirians, who desire to prosecute bee culture systematically. In it, theory is adverted to only incidentally, and in so far as is essential to a clear understanding of the practical processes. The volume contains 309 pages, with 50 illustrations, and is spoken of as being unquestionably the best popular treatise on the subject now extant in the German language. It has not yet been received in this country, but a copy will reach us early in autumn.

Monthly Management.

SEPTEMBER.

In some sections of country, where fall-blossoms abound, bees will find pasturage during a considerable portion of this month; and though much of the honey they now gather is less palatable than that collected at an earlier period, it will answer well for their own subsistence in the coming winter. But their accumulations derived from honey-dews on evergreens generally prove injurious to the stock. This honey is of a very inferior quality, and cannot be properly purified by the bees, because of the lateness of the season at which it is gathered; and as it, for the most part remains unsealed in the cells, it is apt to become acid and produce disease, if the bees happen to be long confined by the severity of the winter, or the inclemency of the weather. Besides this, when tempted to fly, by the occurrence of such honey-dews at so late a period, many bees will be lost by becoming entangled in the webs of spiders, or be destroyed by hornets, which now eagerly watch for, catch, and devour them.

Towards the close of the month the colonies usually contain very little brood; and, if kept in common hives, the bees of such as are not intended to be wintered as independent stocks, may now be driven out and given to the best provisioned standards. The stores and combs may either be appropriated at once, or reserved in the hive for spring use, to receive the earliest swarms. Where movable comb hives are used, it is unnecessary to defer these operations to so late a period, as the combs still containing brood may at any time be transferred to the hives intended to be wintered, and colonies can be united without producing much commotion among the bees. Such colonies only as are in a healthy condition, have a young and fertile queen, and ample stores of honey and pollen, should be wintered. The attempt to carry feeble stocks through the winter will almost invariably end in disappointment, besides being attended with continual vexation of spirit. The making of artificial colonies, properly employed, is of incalculable importance in bee culture, mainly because we can thereby always secure a supply of young and vigorous queens, but it becomes ruinous to an apiary, when the beekeeper multiplies stock injudiciously and inordinately, and then undertakes to winter his feeble and ill-provisioned colonies. None should be reserved for wintering, but such as have at least twelve pounds (nett) of sealed honey on the first of October, and have sound clean combs, a healthy vigorous queen, and bees

enough to cover five or six combs when clustered on them in the evening. All that fall below this standard should be broken up, adding the bees to other stocks, and using the stores for further provisioning the weaker of those retained. The poorer the season was, the more care should be taken to unite and strengthen colonies in the fall. All the good, new and clear combs obtained by these operations, should be carefully preserved for spring use—they will "come into play" when hiving early swarms, or making artificial colonies. These, if supplied duly with good empty comb, will in three or four weeks, be quite as valuable as an old stock whose feebleness exacted much attention and constant care during the winter. He who is in the habit of wintering weak colonies, must never expect to become a prosperous beekeeper. He will have trouble during the winter, and with all his watchfulness will lose some stocks; those which survive will make slow progress in the spring, be laggards during the summer, and instead of yielding him some surplus honey in the fall, will probably need renewed nursing.

Even if after a favorable season, it be found that all the colonies in an apiary have secured sufficient supplies, it will still not be advisable to winter them all. Among them there will probably be some whose queens are old and decrepid. Should these chance to survive till spring, the number of eggs laid by them would be too small to replenish the population of their respective hives, adequately and early. Such had better be disposed of in the fall. If the hives contain good combs and a sufficiency of stores, the superannuated queens should be removed and replaced by a young one, from a colony not so well prepared, in other respects, to pass the winter safely. Italian queens may at this time be more conveniently introduced into common colonies, than at almost any other period. There being now but little brood in the combs, the workers are less disposed to build royal cells after the removal of the old queen; and the Italian queen may, without disadvantage, be kept confined in a cage for a week or longer, till the bees have become entirely willing to accept her. Queens may likewise be used, whose genuineness has been previously ascertained or fully tested.

Those who still practise the old mode of taking surplus stores from the colonies, by cutting out a portion of the combs containing sealed honey, must deal liberally with their bees—allowing them to retain a full sufficiency for their support, so situated as to protect them from the severity of the weather, and being likewise conveniently accessible, from time to time, as needed. It is better that the bees should have more than enough, than to rely on spring feeding, should their supplies fall short.

Colonies which still retain their drones at the close of this month, are usually queenless. The population of such is almost invariably much reduced and composed of old bees exclusively, which are not well qualified to endure the rigors of winter. The proper course is to break them up, and appropriate the honey. The combs of such stocks generally contain large quantities of pollen, and should therefore be preserved till the close of winter. Then they may profitably be given to young stocks of the previous year, which are rarely well supplied with that article.